

Name: \_\_\_\_\_

Period: \_\_\_\_\_ Date: \_\_\_\_\_

## Ball Bounce Experiment

**Purpose:** To find the "bounce constant" for a given ball.

**Procedure:**

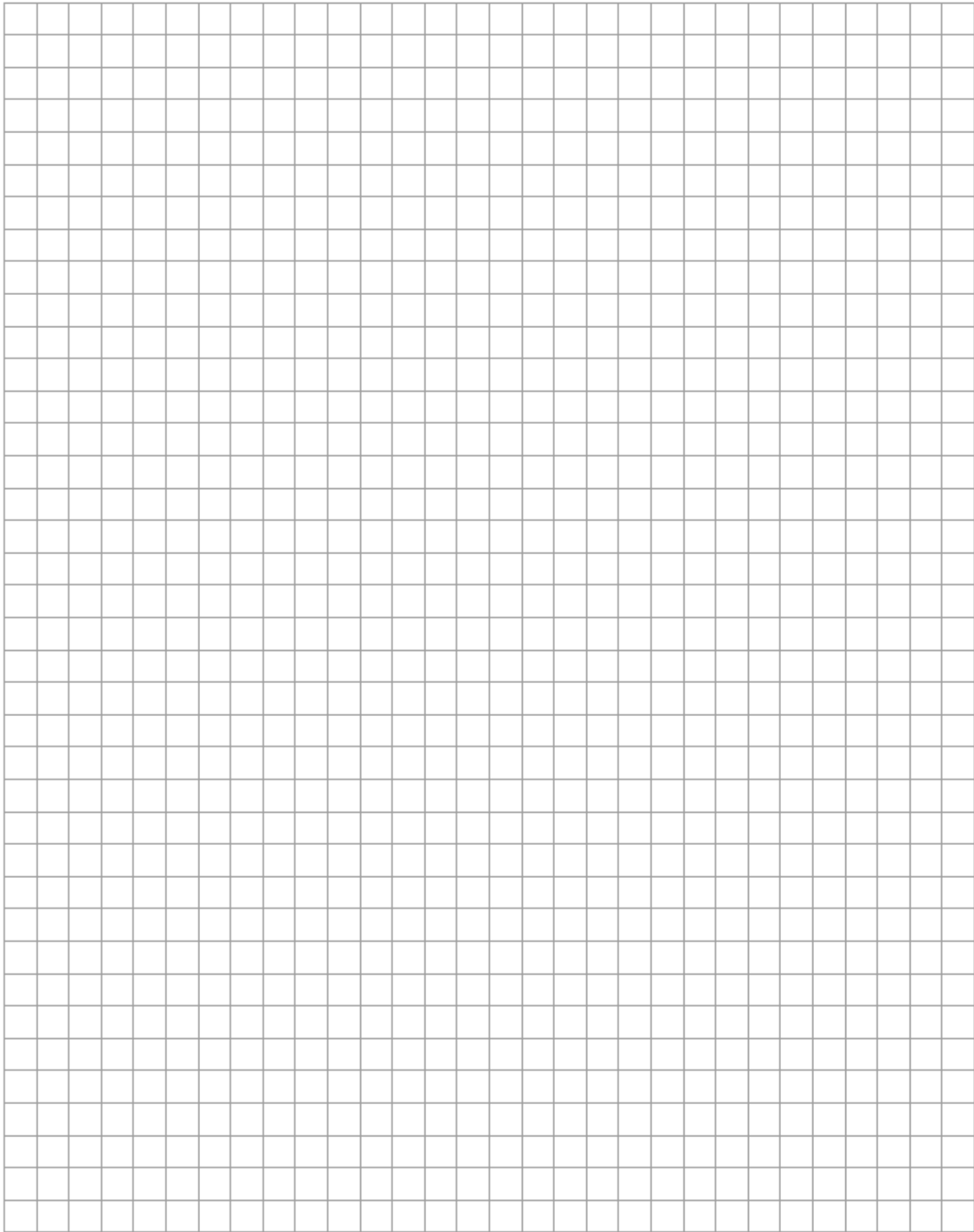
1. One person drops a ball from a pre-determined height above the ground while a second person watches to see how high the ball bounces on its first bounce only. Use the bottom of the ball for drop height and rebound height measurements.
2. Record the result.
3. Repeat 2 more times and find the average for the three drops
4. Repeat steps 1-3 for eight heights above the ground.

Height	Trial A	Trial B	Trial C	Average

5. Plot the averages on the attached graph by placing the drop height on the x-axis (horizontal) and the bounce height on the y-axis (vertical). Use as much of the graph as you can for your data. Use centimeters for your units.
6. Using a ruler, draw a single straight line that comes the closest to all of the points at once (line of best fit).
7. Take two points on the line (not data points) to calculate the slope of the line. Use points far apart near the ends of the line.
8. Use these two points to calculate the slope of the line. This is your "bounce constant".

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$$

9. Bounce constant = \_\_\_\_\_



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10. Give your graph a title and label the x- and y-axes. Be sure to include units with your axes titles.
11. Use the slope and the y-intercept of your line to write an equation for your line in slope-intercept form. \_\_\_\_\_
12. Should there be an x- or y-intercept? Explain why or why not. \_\_\_\_\_

13. List three reasons why your data may not be 100% accurate.

- a. \_\_\_\_\_  
\_\_\_\_\_
- b. \_\_\_\_\_  
\_\_\_\_\_
- c. \_\_\_\_\_  
\_\_\_\_\_

14. Why do you think I made you do three trials and then average the results? \_\_\_\_\_  
\_\_\_\_\_

15. List three ways in which the accuracy and/or precision of this experiment could be improved (within the means of an average high school classroom).

- a. \_\_\_\_\_  
\_\_\_\_\_
- b. \_\_\_\_\_  
\_\_\_\_\_
- c. \_\_\_\_\_  
\_\_\_\_\_

16. Why do you think the rebound height was less than the drop height? \_\_\_\_\_  
\_\_\_\_\_

17. If you did this experiment on your table, then did the exact same experiment on the floor, would you expect different results? Why or why not? \_\_\_\_\_  
\_\_\_\_\_

18. Try to think back to the Physical Science class you took in middle school and write down all of the physics laws, principles, or terms you can remember that are involved in this experiment.

_____	_____
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